National Institute of Environmental Health Sciences

The effect of ventilation strategies of child care centers on indoor air quality and respiratory health of children in Singapore

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Abstract:

This paper reports the effects of ventilation strategies on indoor air quality (IAQ) and respiratory health of children within 104 child care centers (CCCs) in a hot and humid climate. The CCCs were categorized by ventilation strategies: natural (NV), air-conditioned and mechanically ventilated (ACMV), air-conditioned using split units (AC), and hybrid (NV and AC operated intermittently). The concentration levels of IAQ parameters in NV CCCs are characterized by the influence of the outdoors and good dilution of indoor pollutants. The lower ventilation rates in air-conditioned CCCs result in higher concentrations of occupant-related pollutants but lower outdoor pollutant ingress. This study also revealed lower prevalence for most asthma and allergy, and respiratory symptoms in children attending NV CCCs. In multivariate analyses controlled for the effects of confounders, the risk of current rhinitis among children is significantly higher if they attend mechanically ventilated CCCs compared to NV CCCs. Air-conditioned CCCs were also associated with higher adjusted prevalence ratio of severe phlegm and cough symptoms and lower respiratory illness. Finally, children attending CCCs with hybrid ventilation are at high risk for almost all the respiratory symptoms studied. © 2007 The Authors Journal compilation 2007 Blackwell Munksgaard.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

Air Pollution: Allergens

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Singapore

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Asthma, Upper Respiratory Allergy

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Low Socioeconomic Status, Racial/Ethnic Subgroup

Other Racial/Ethnic Subgroup: Malay;Indian

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content